

Number Space Overview User eXperience Design

Proposal design for Comptel Number Management System

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This design proposal is for the recruitment evaluation of Comptel only. 2016.

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Number Space Overview for Number Management System

This design is to help telecom operators who need to manage phone numbers or IP addresses.

Number space is a list of bulk numbers from a governing body.

In this proposal, the design proposes a simple and smart design to see overview of the massive number space.

Design Requirements

p.4 ● DR1. Graphical representation of all the phone numbers. 2.5 million phone numbers in bulk.
Divide it to used/free numbers.

p.4 / 6 / 7 ● DR2. Graphical representation of all the IP addresses. 1 million IP addresses. Divide it to used and free addresses.

p.8 ● DR3. Numeric statistics for free/used .

p.8 / 9 ● DR4. A rate of number/address reservation.

p.5 ● DR5. The view with controls for deep diving into the list of exact numbers and addresses.

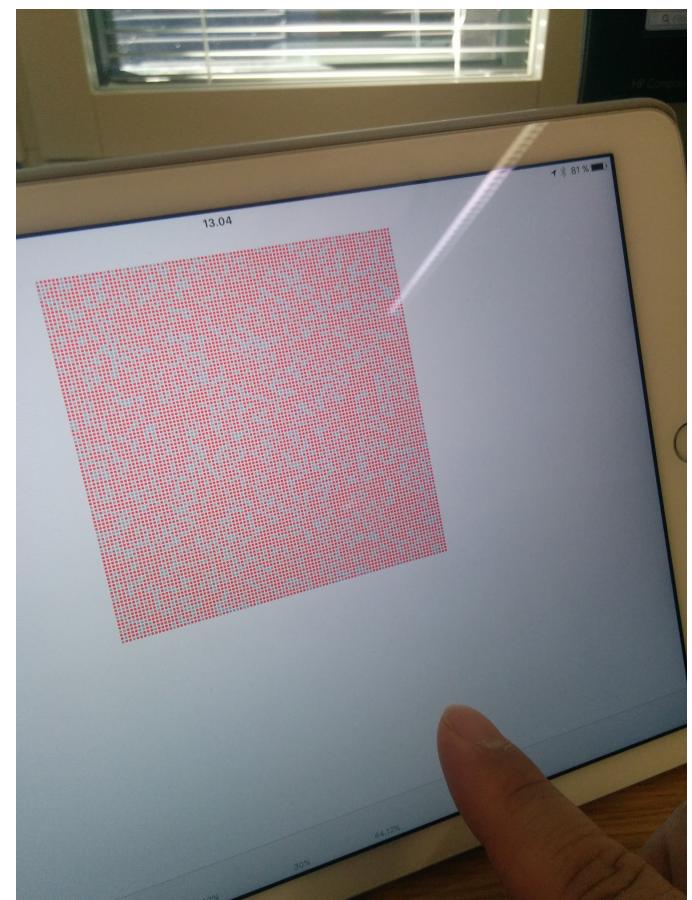
p.9 ● DR6. A call to action to order more numbers and addresses.

Test: Visualizing raw data with sample data

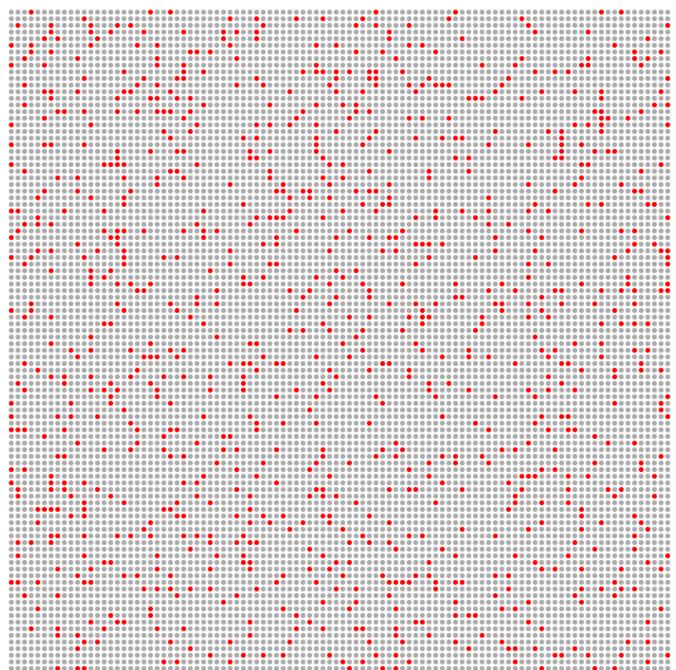
At first, I need to understand how data may look like. So create sample data (10,000) and visualize it on a cube by creating a test app.

Coding a prototype with SWIFT2, makes 4 samples from 4 sets of randomized data(MS excel, miniTab). From this test, decide to make it as an elementary block for the 2.5million numbers/1million IP addresses. It will be a block of data visualization, has 100 x 100 matrix.

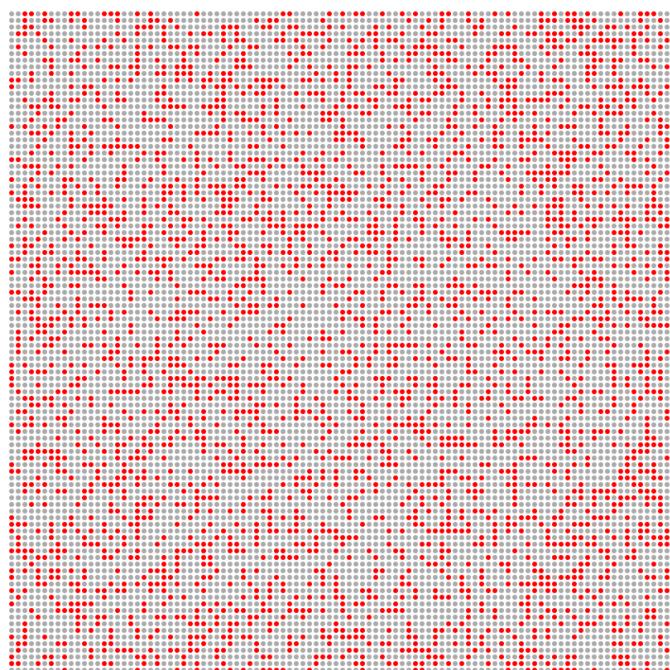
Find source: <https://github.com/alfpooh/numberspace>



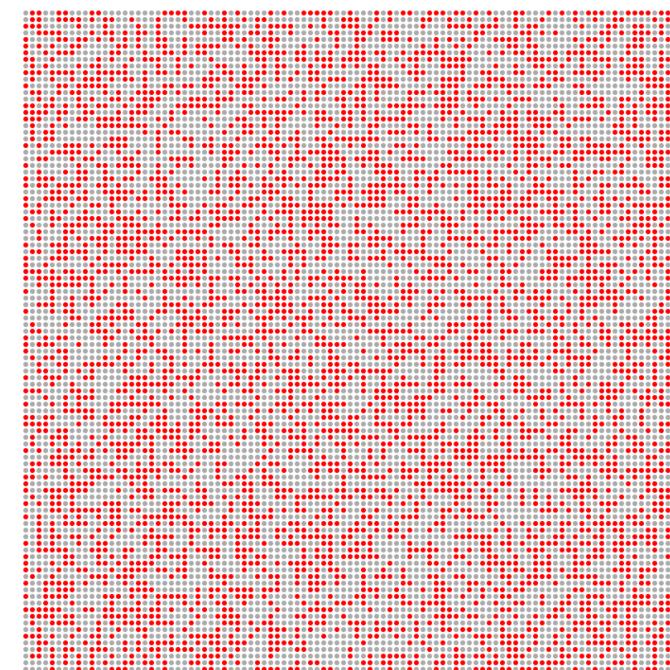
Visualized raw data (10,000)



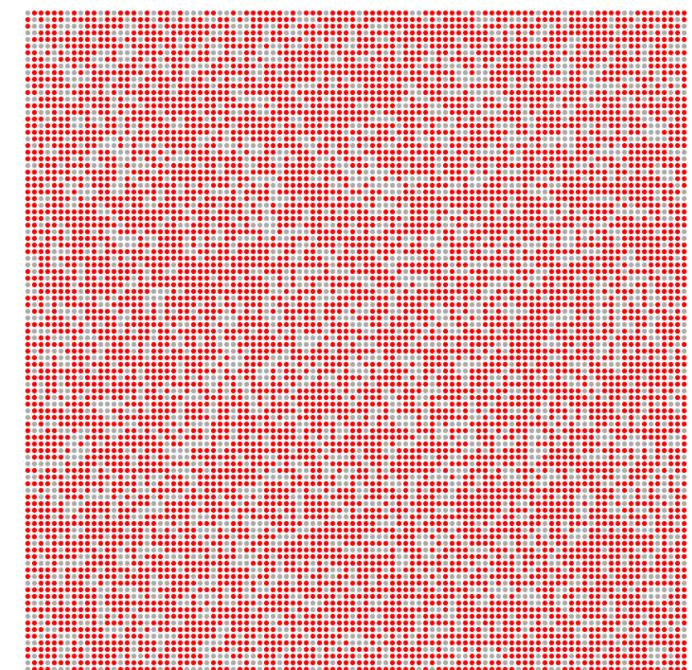
10% of used, 90% of free



30% of used, 70% of free



4412 used, 44.12% used.

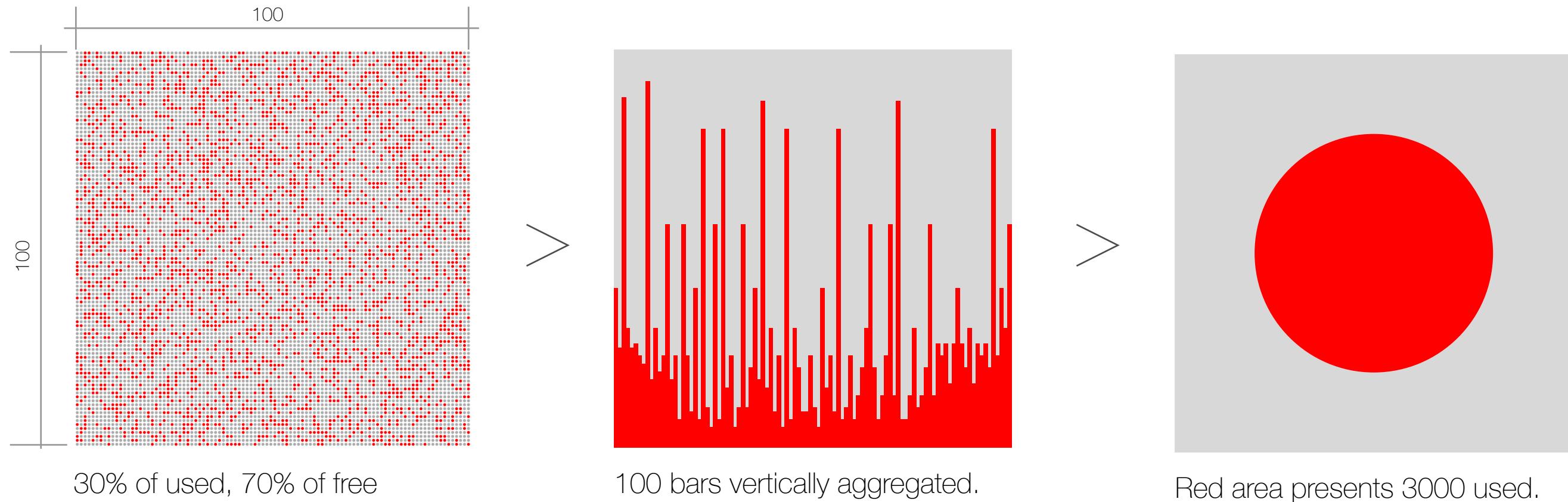


70% used, 30% free.

Abstraction

To manage complexity of number space, a block will hold 10,000 numbers(or IP addresses) in a form of 100x100 matrix.

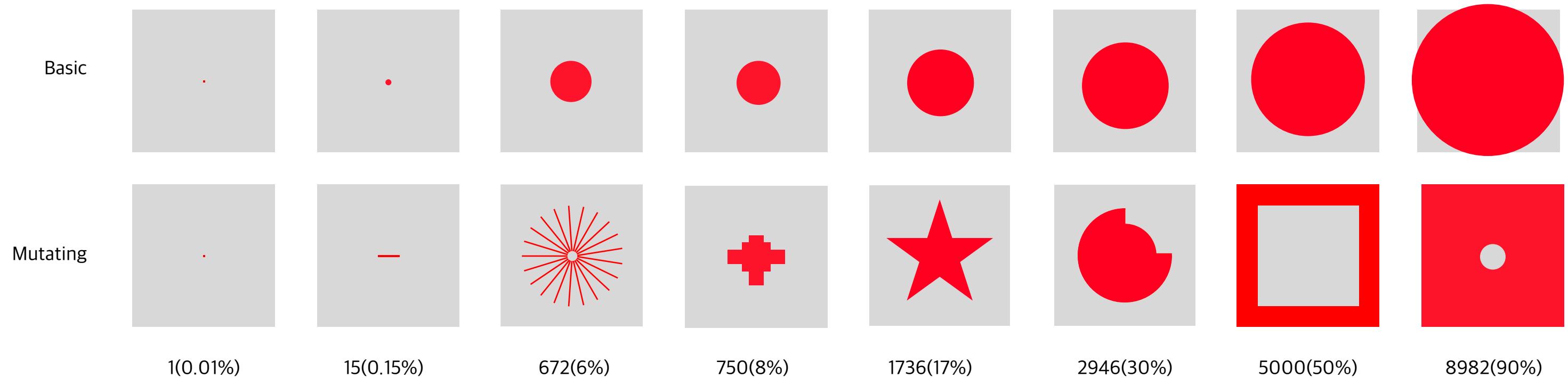
This matrix can evolve into a higher level of abstraction as a simplified form.



Variation of block visualization

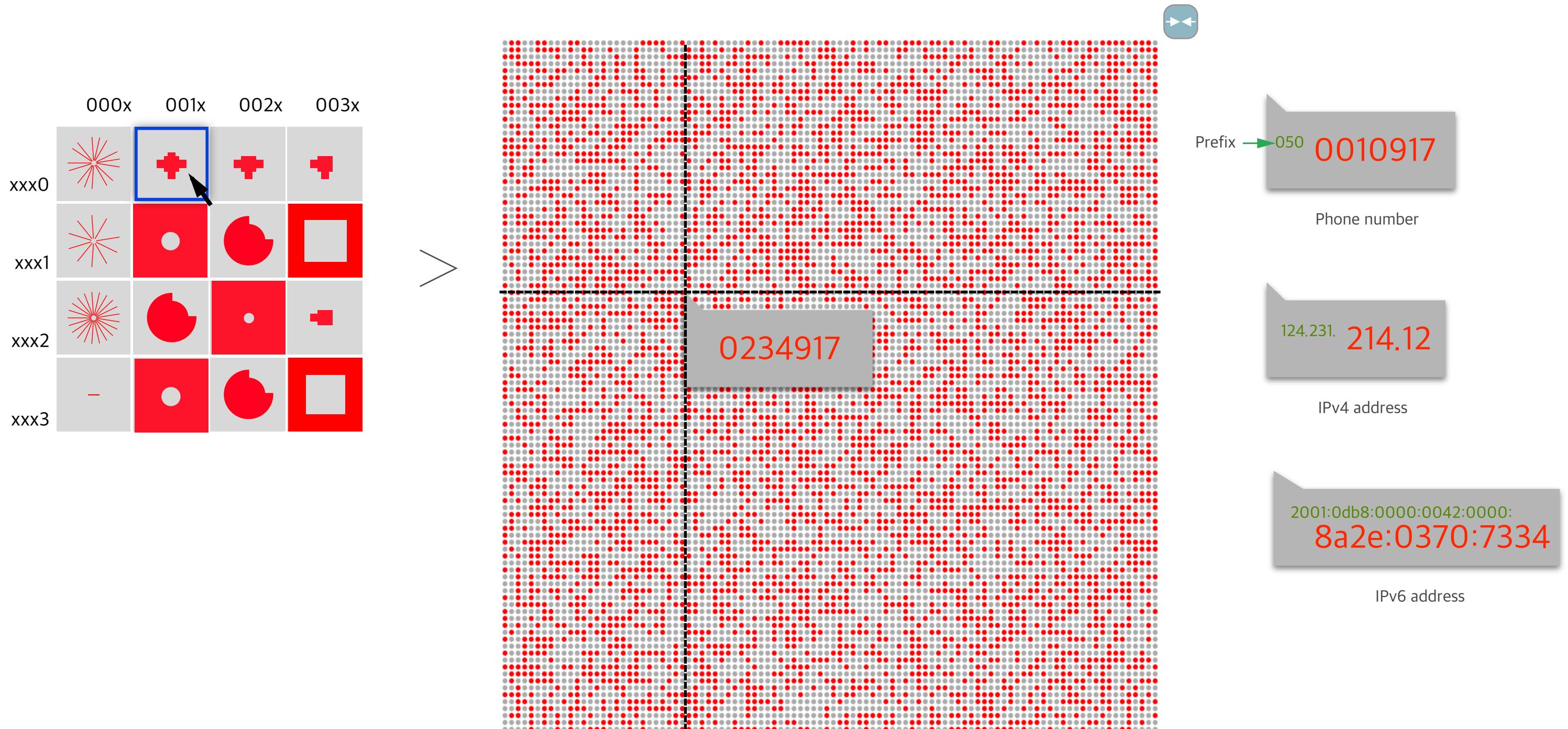
As number of used data increased, a block will show bigger area of used area. It can be a simpler graphic form of aggregated area such as circle.

Otherwise, a form of an aggregated area may be able to mutate into a variety of shapes and styles by scale of number.



Deep diving into a raw data

User may browse from high abstract model to a raw data showing actual content.



1. Select a block from block set

2. Clicked block will be expanded and shows raw data visualization. User can move cursor over the block. Cross line will be displayed. Balloon with content will be displayed over it. User can click a cell to see what it is.

Depend on data type, it may be displayed as a phone number format, IPv4 or IPv6.

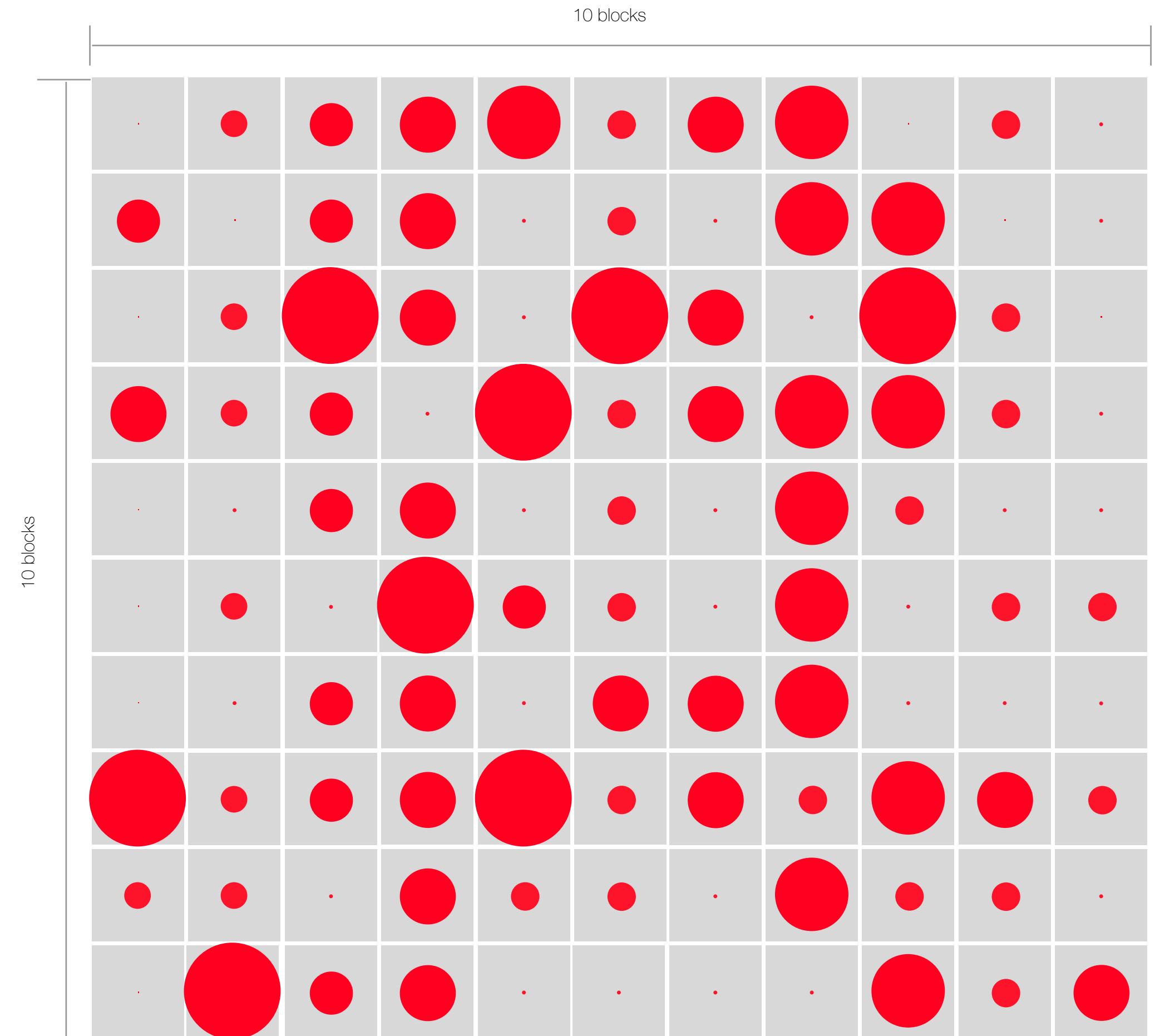
Demo: 1 million data

Basic circular shape blocks, 100 blocks with 10,000 numbers/IPs

This is an experiment to visualize 1 million data with 100 blocks. Each blocks represent 10,000 data.

User may recognize which block is relatively more used than others or less used than others.

But some small size shapes are difficult to see.



Demo: 1 million data

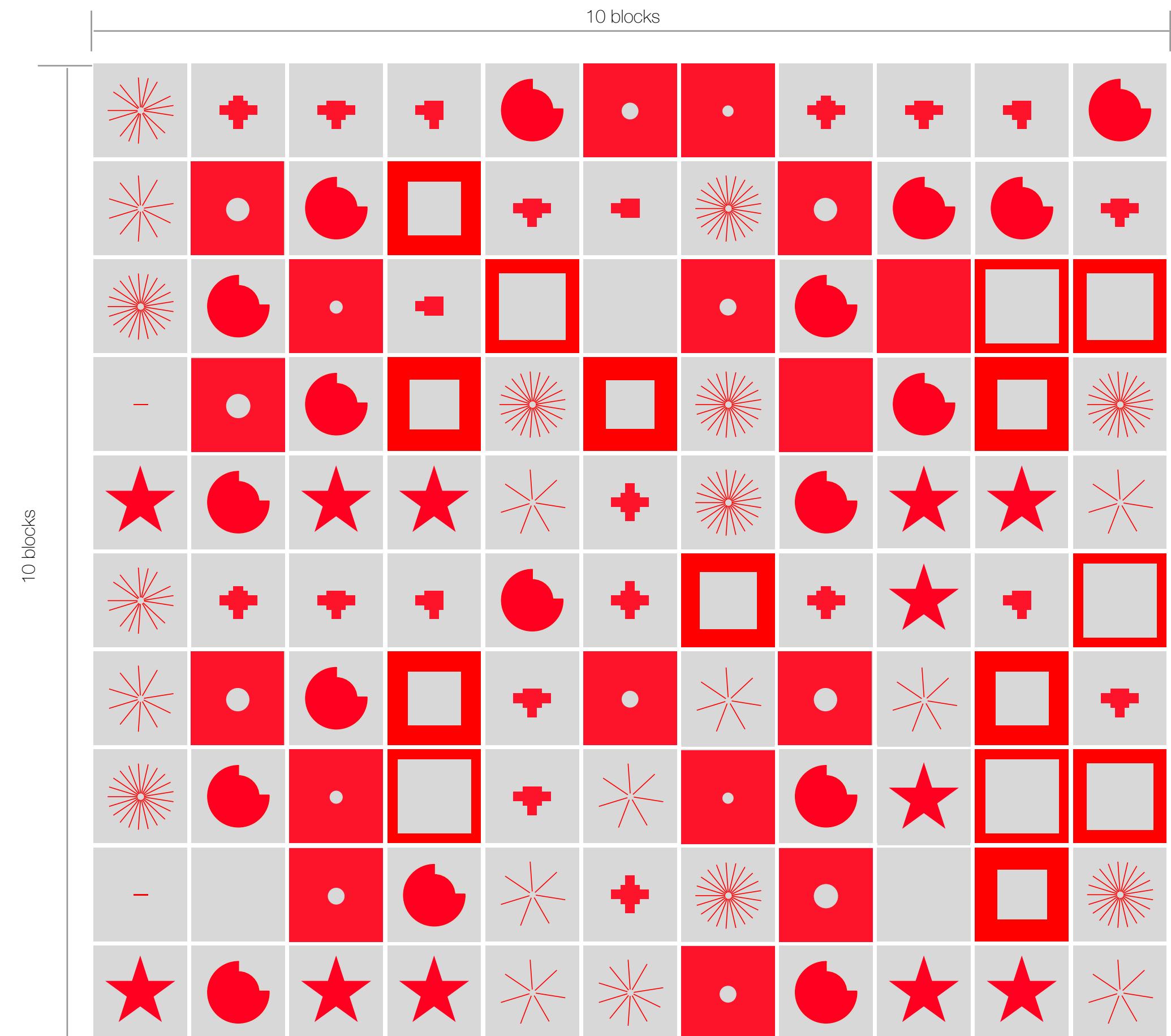
Mutating blocks, 100 blocks with 10,000 numbers/IPs

This is an experiment to visualize 1 million data with 100 blocks. Each blocks represent 10,000 data.

User may recognize which block is relatively more used than others or less used than others.

Level of mutation can help user to understand used rate in a block without optical problem. It is easy to identify small used block as well.

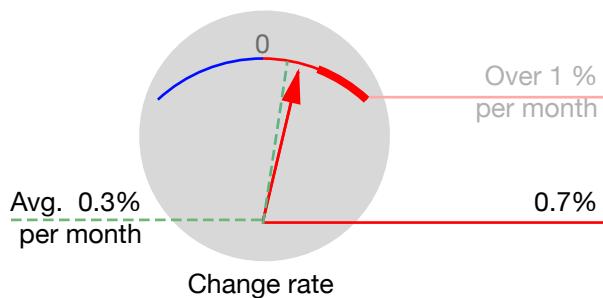
Some user may feel it is too much visually busy. Of course, later a designer can develop more sophisticated mutating shapes.



Dashboard

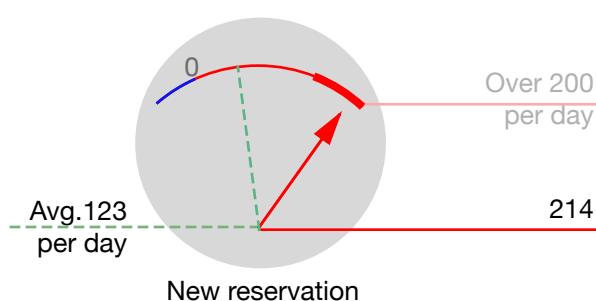
Dashboard will display overview values in graphical forms.

Change rate meter:



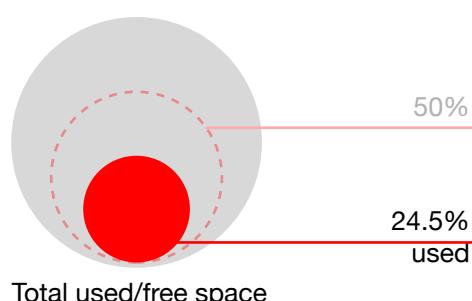
It shows percentage value of changed from last 30days. Previous average rate will be displayed (dotted line). Meter has negative range, positive range, and warning range (generate a warning)

New reservation meter:



It shows number of new reservation. Displaying running average as a reference. It is possible to be minus. If it is over a certain number, it will warn user automatically.

Total usage meter:



It shows amount of total number space and used space together. 50% area will be a reference. Display how much percentage is used and free now.

Usage projection:



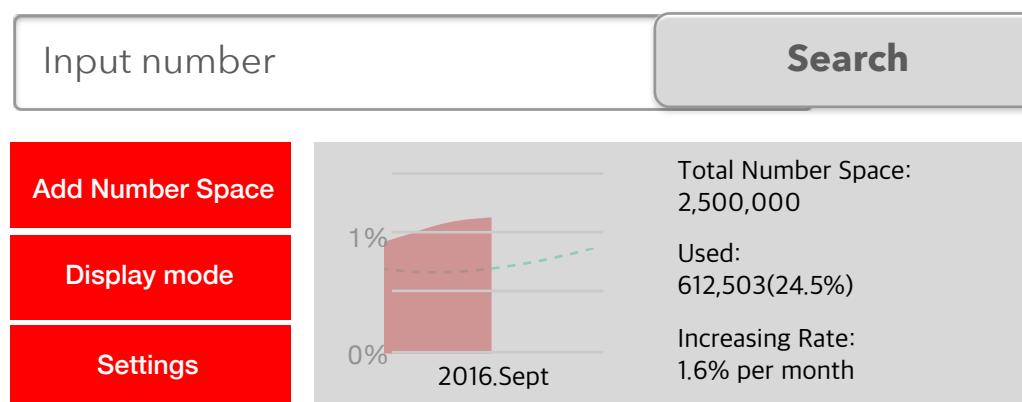
It shows a prediction when it might be able to reach 99%. Projected calculation by current change rate and monitored usage pattern.

Dashboard continued...

Dashboard have overview statement, functions such as settings, add number space, and search.

XYZ networks

612,503 subscribers
24.5% used
0.7% change rate
214 new user



Overview statement

It shows 4 key performance indexes.

1. Total subscribers of phone number space / IP address
2. Percentage of used space.
3. Change rate.
4. New user from today.

Functions

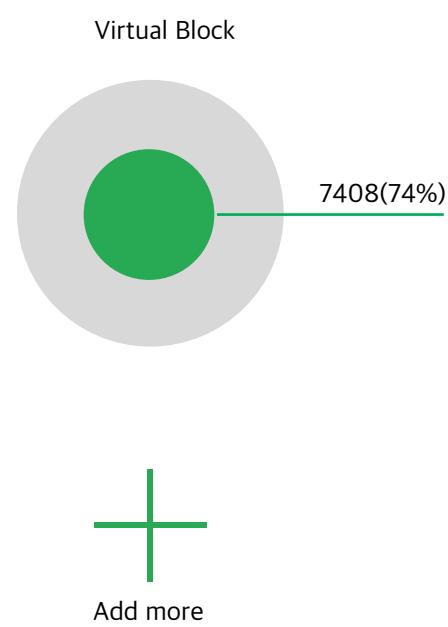
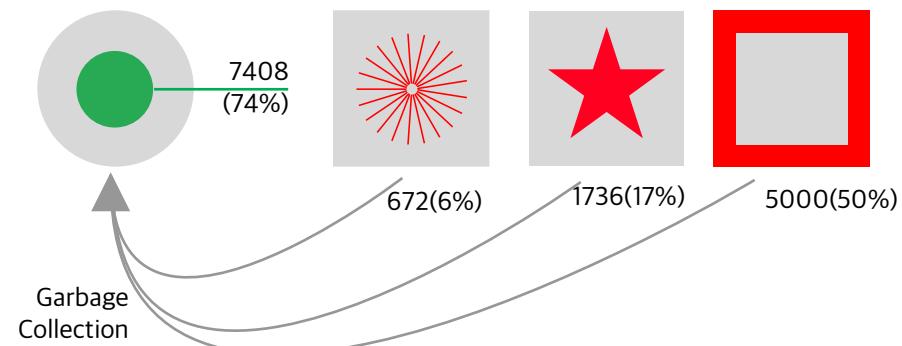
1. Add more number space: Purchase more space from governing body.
2. Display mode: switch display mode to raw/basic/advanced
3. Settings: User may set a warning range, automatic notification etc.

Virtual block

Virtual block is an idea for simplifying remained free space management. Select multiple blocks and aggregate free space and make a new virtual space block. It may help user to manage free space easily.

Create a virtual block

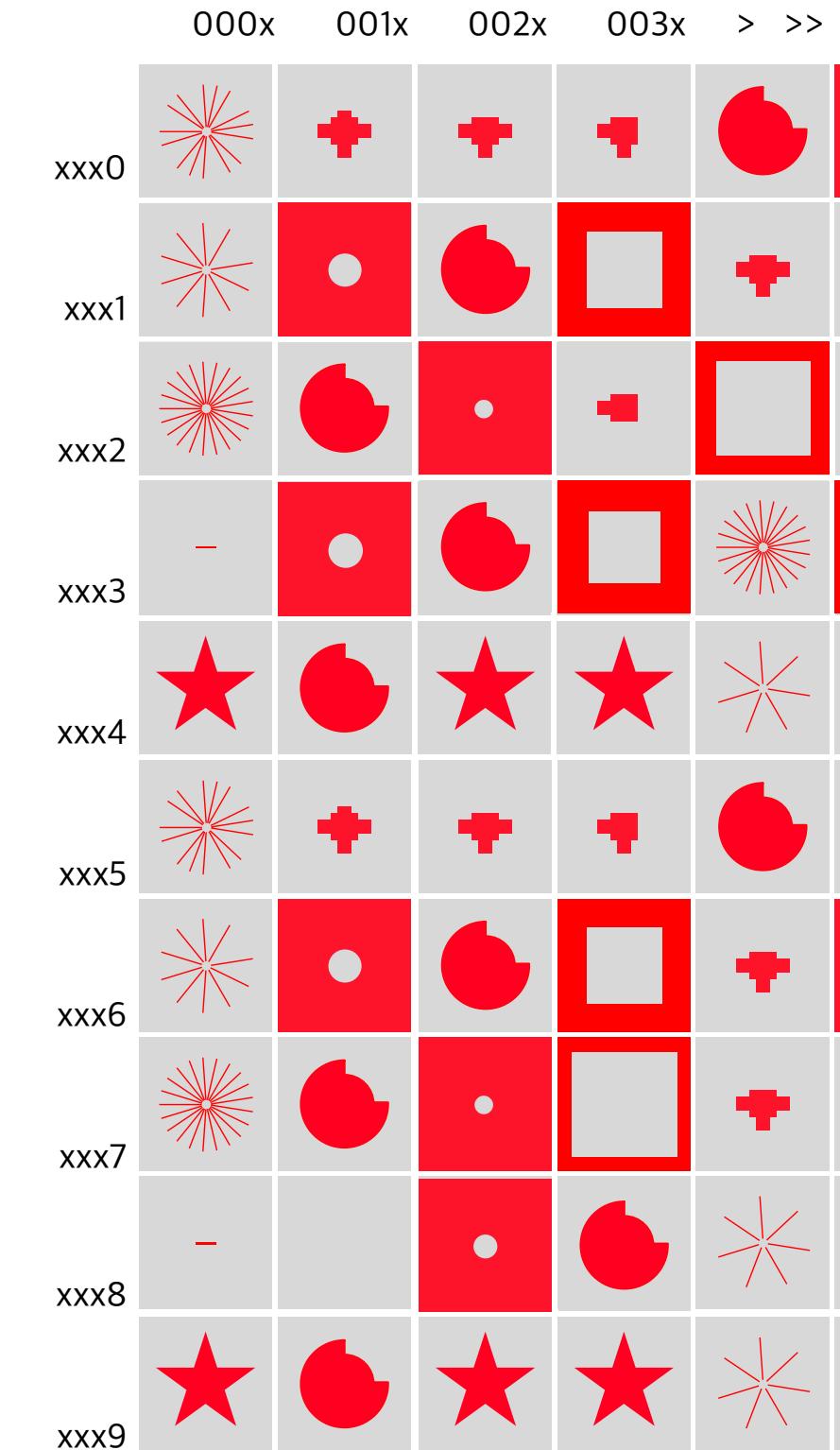
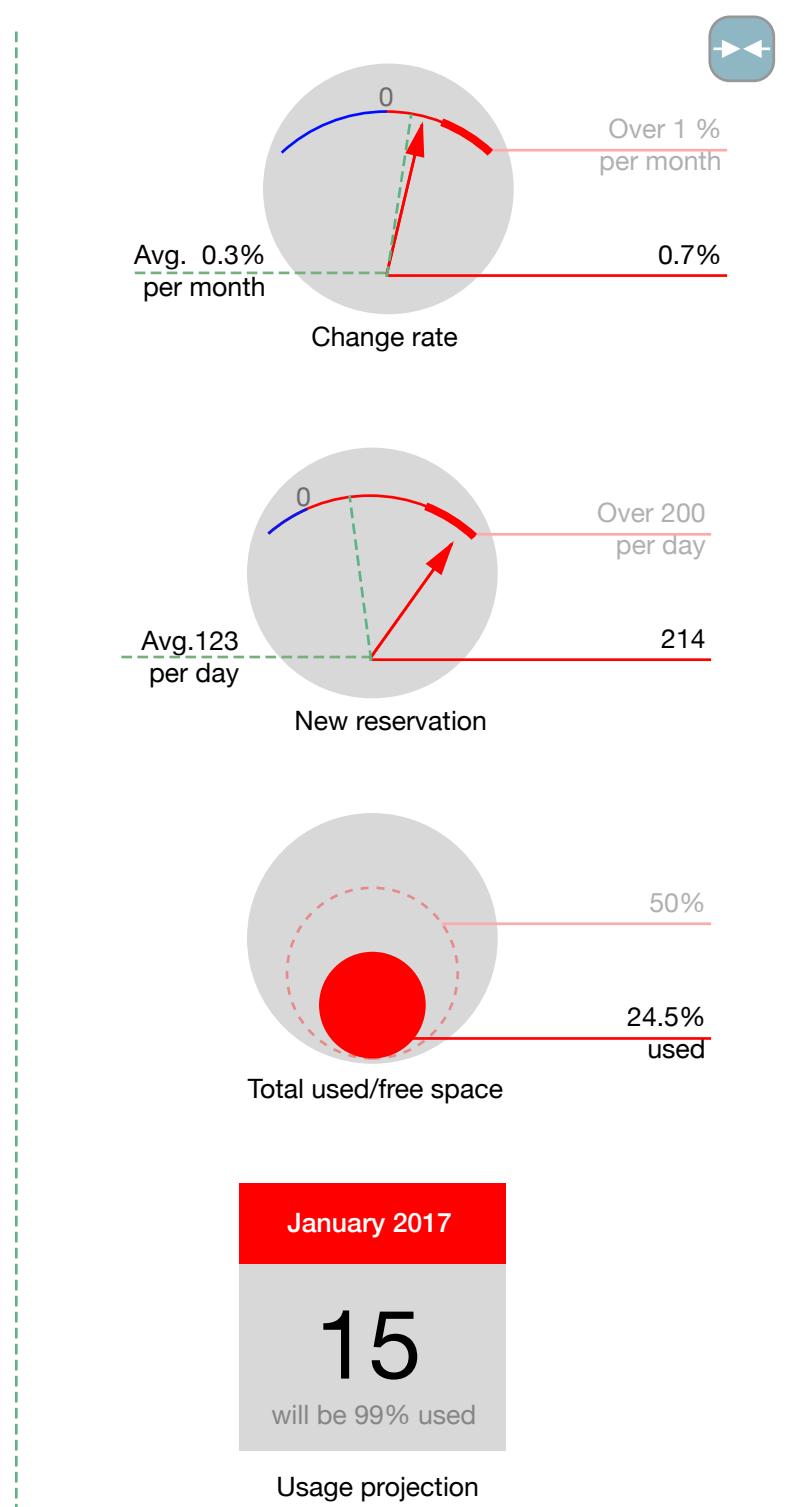
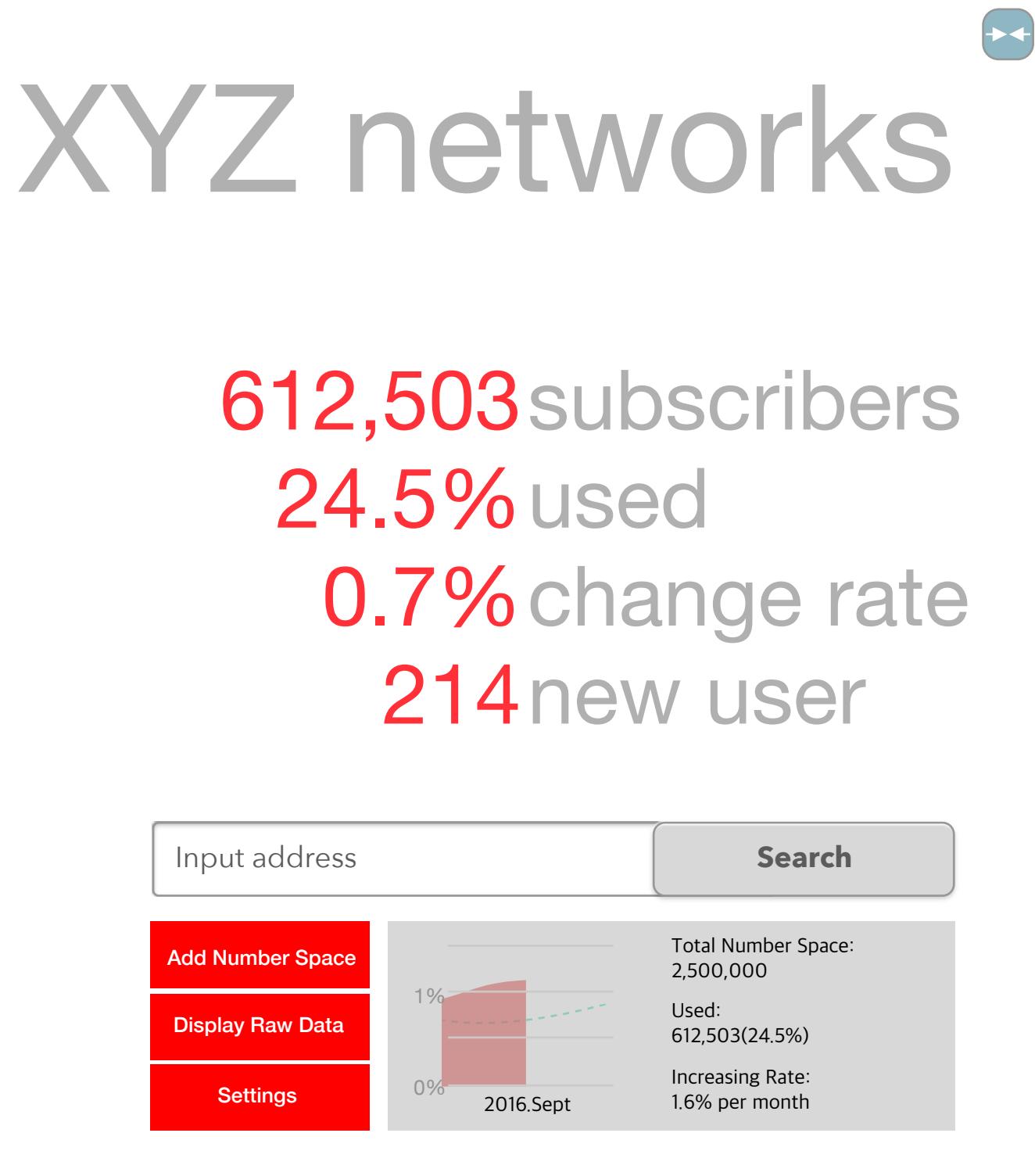
1. Tap “add more”
2. Select blocks to aggregate.
3. Drag and drop to add more blocks.



	000x	001x	002x	003x	004x	005x
xxx0	★	+	+	+	●	○
xxx1	★	○	●	□	+	+
xxx2	★	●	○	-	+	□
xxx3	-	○	●	□	★	□
xxx4	★	●	★	★	★	+
xxx5	★	+	+	+	●	+
xxx6	★	○	●	□	+	○
xxx7	★	●	○	□	+	★
xxx8	-		○	●	★	+
xxx9	★	●	★	★	★	★

Layout for Phone number space, 25 Million.

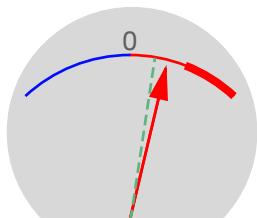
Horizontal layout. Number space is scrolling horizontally.
Overview and dashboard can be shrunked or expanded.



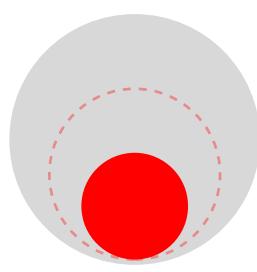
Layout for Phone number space, 25 Million.

While block set is scrolling, dashboard is automatically shrunked in response.

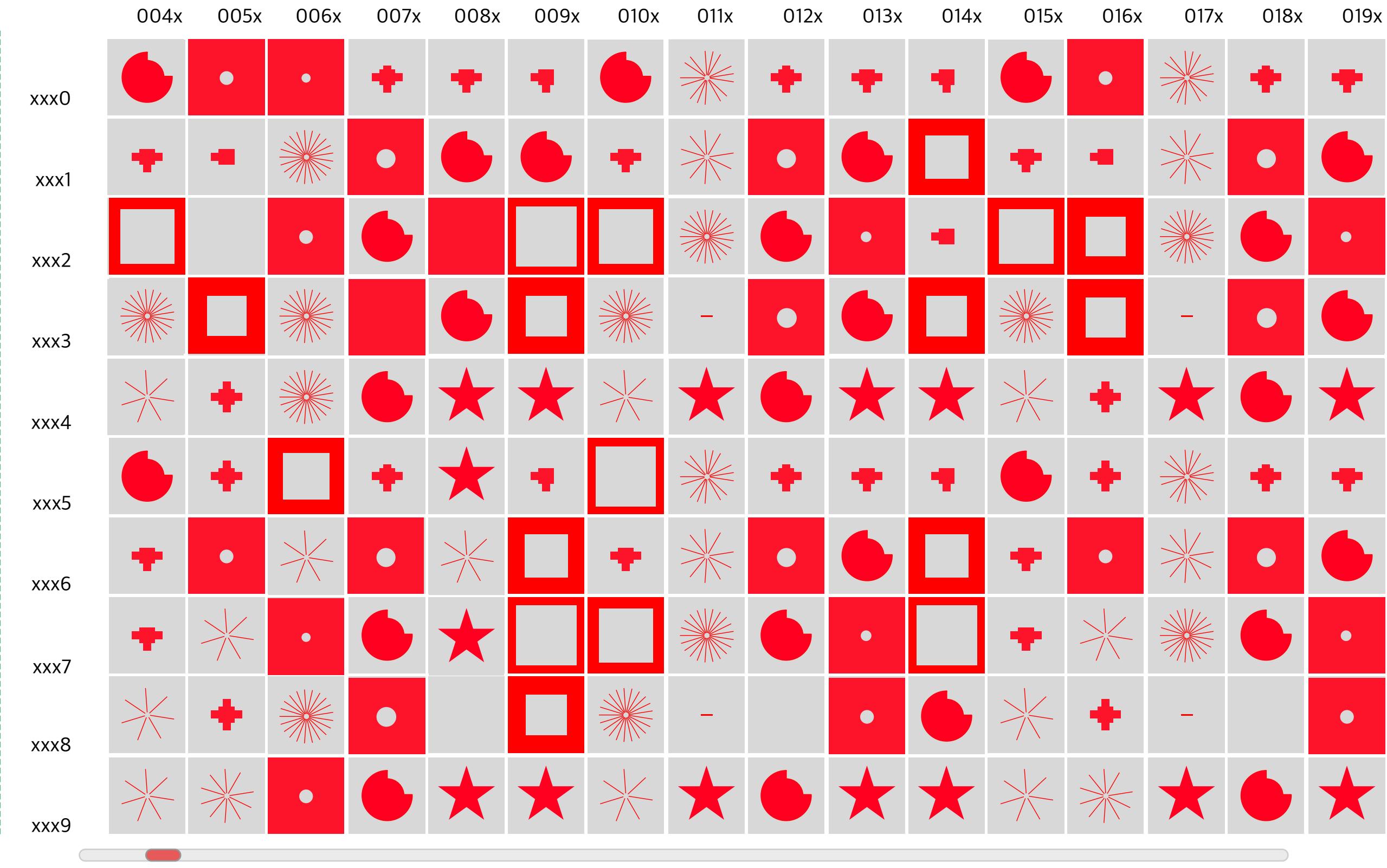
XYZ
networks



Change rate

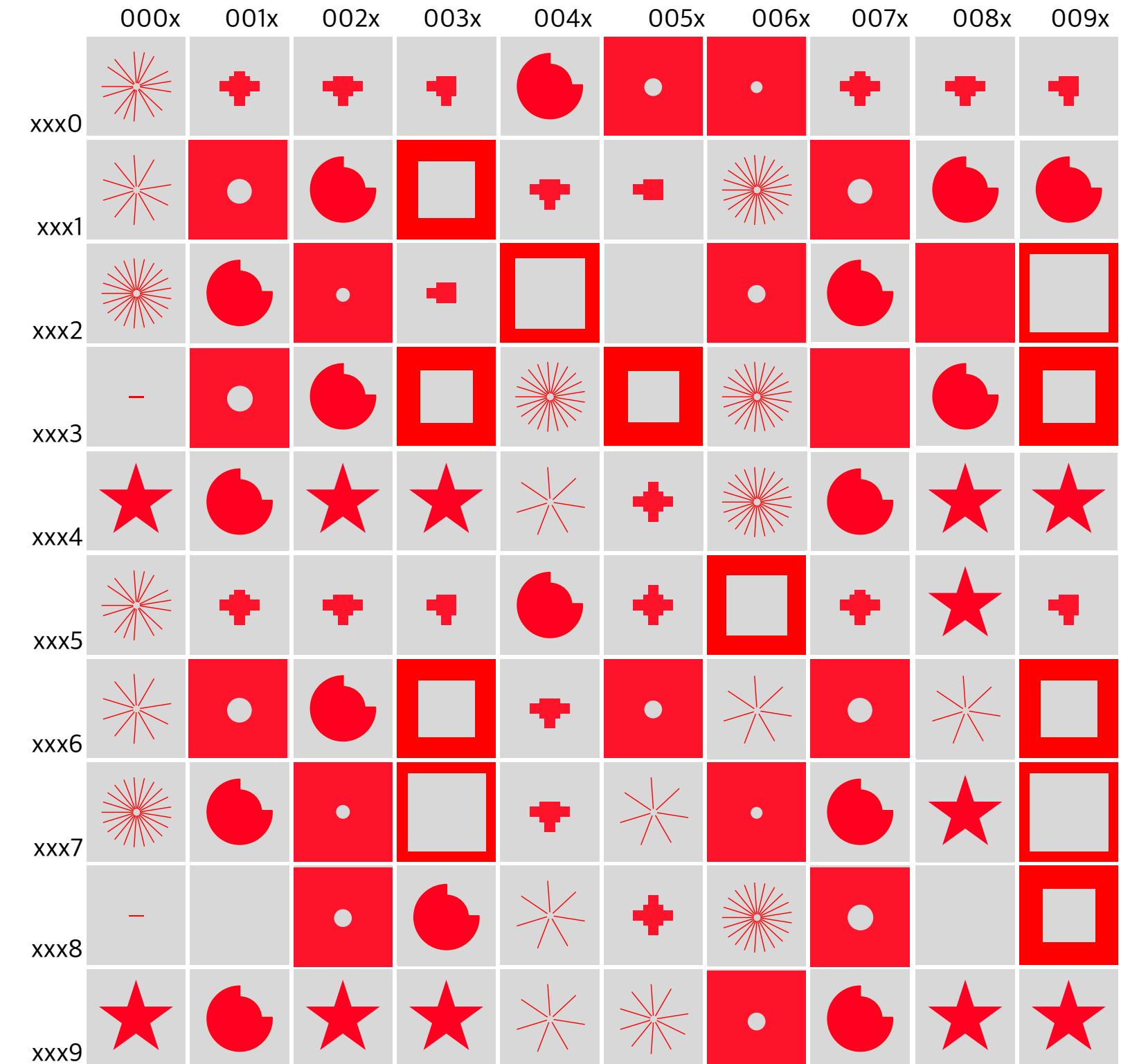
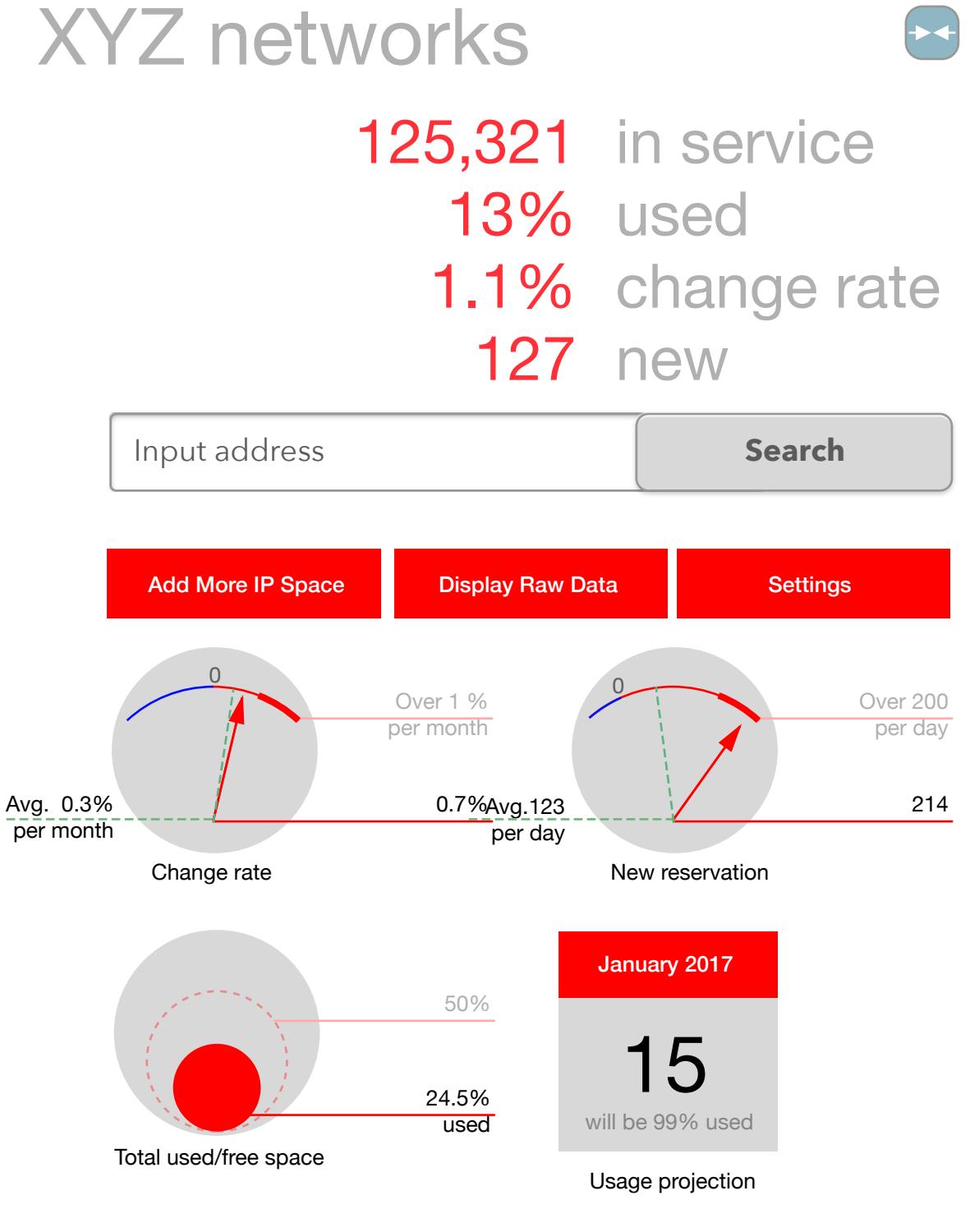


Total used/free space



Demo: Layout for IP address space, 1 Million.

All overview and data visualization in one page.



Kittos, Thanks, 감사합니다.

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